IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of: Bryan Wolf

Application No.: 10/006,496

Filed: December 5, 2001

Title: METHOD FOR REPRESENTING A GAME AS A UNIQUE NUMBER

Applicant's Reference: IGT1P064/P-4(

Examiner: UNASSIGNED

Group: UNASSIGNED

CERTIFICATE OF MAILING
I hereby certify that this correspondence is being deposited with the United States Postal Service as First Class Mail to: Commissioner for Patents, Washington, DC 20231 on January 14, 2002.

Signed: Leslie Russell
Leslie Russell

Separate Letter to the Official Draftsman

Commissioner for Patents
Washington, D.C. 20231

Dear Sir:

Enclosed are the formal drawings for the above-identified patent application. If the Draftsman has any question concerning the corrected drawings, he or she is respectfully requested to contact the undersigned.

Respectfully submitted,
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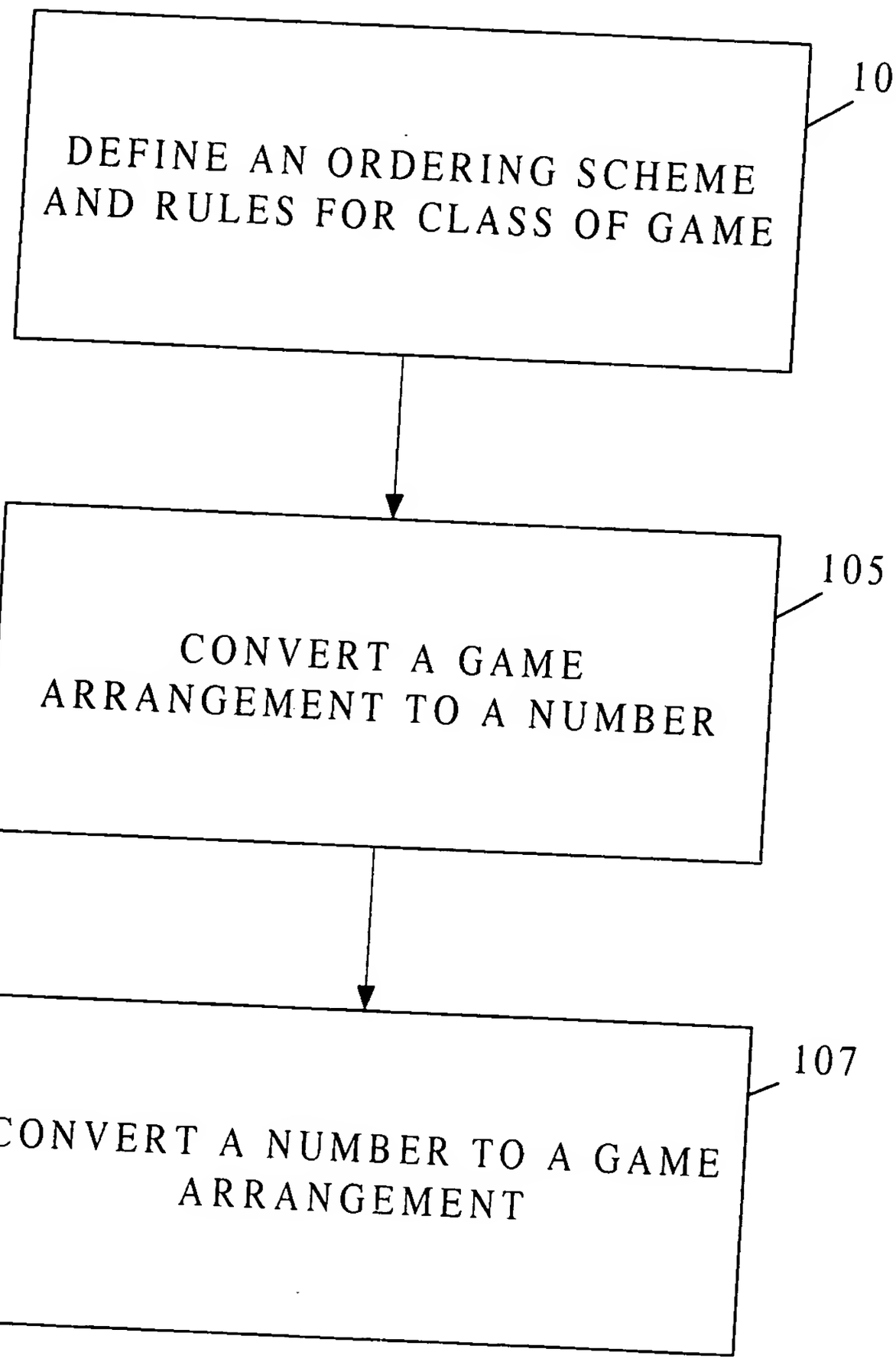

101
DEFINE AN ORDERING SCHEME AND RULES FOR CLASS OF GAME
103
CONVERT A GAME ARRANGEMENT TO A NUMBER
105
CONVERT A NUMBER TO A GAME ARRANGEMENT
107

Figure 1

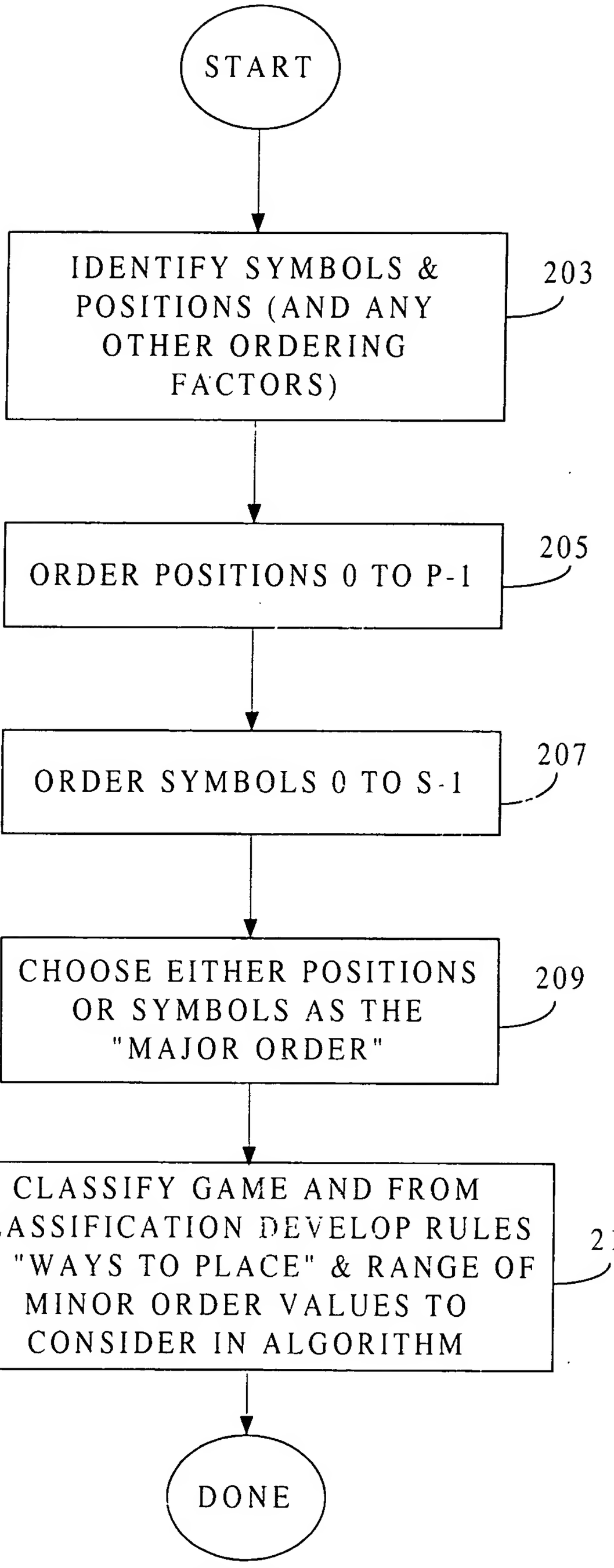
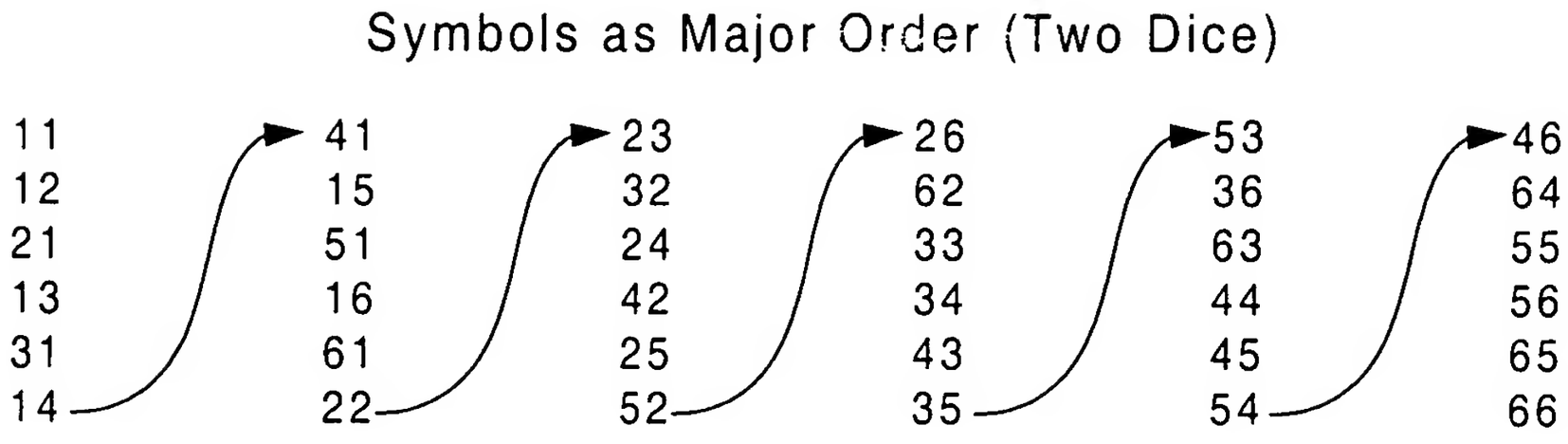

START
201
IDENTIFY SYMBOLS & POSITIONS (AND ANY OTHER ORDERING FACTORS)
203
ORDER POSITIONS 0 TO P-1
205
ORDER SYMBOLS 0 TO S-1
207
CHOOSE EITHER POSITIONS OR SYMBOLS AS THE "MAJOR ORDER"
209
CLASSIFY GAME AND FROM CLASSIFICATION DEVELOP RULES RE "WAYS TO PLACE" & RANGE OF MINOR ORDER VALUES TO CONSIDER IN ALGORITHM
211
DONE

Figure 2

2h	3h	4h	5h	6h
2h	3h	4h	5h	7h
2h	3h	4h	5h	8h
		⋮		
2h	3h	4h	5h	Ah
2h	3h	4h	6h	7h
2h	3h	4h	6h	8h
		⋮		
3h	4h	5h	6h	7h
3h	4h	5h	6h	8h
		⋮		
9s	10s	Js	Qs	Ks
9s	10s	Js	Qs	As
		⋮		
10s	Js	Qs	Ks	As

Figure 3


Symbols as Major Order (Two Dice)
11
12
21
13
31
14
41
15
51
16
61
22
23
32
24
42
25
52
26
62
33
34
43
35
53
36
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44
45
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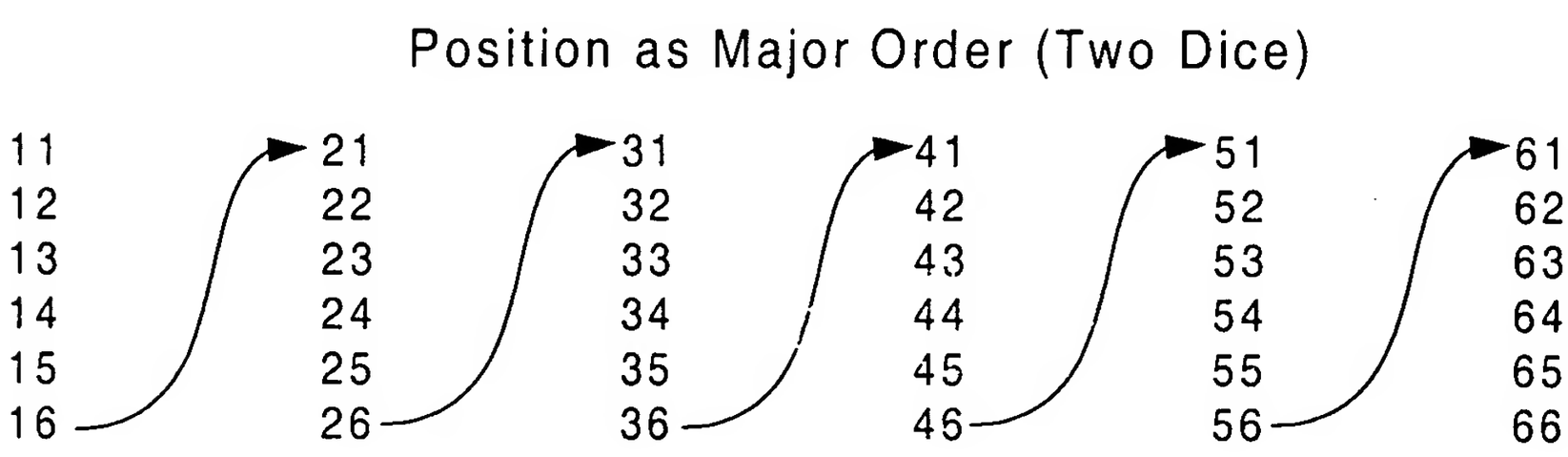
46
64
55
56
65
66


Position as Major Order (Two Dice)
11
12
13
14
15
16
21
22
23
24
25
26
31
32
33
34
35
36
41
42
43
44
45
46
51
52
53
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55
56
61
62
63
64
65
66

Figure 4

Poker Hand Under Consideration	3H	KH	2D	7C	4S	
number skipped over at position P=0	2H	3H	4H	5H	6H	
	2H	3H	4H	5H	7H	
	•	•	•	•	•	
	2H	10S	JS	QS	KS	Ways to place 3H 4H, ...
	2H	JS	QS	KS	AS	
	3H	4H	5H	6H	7H	
	3H	4H	5H	6H	8H	
			•			
			•			
			•			
	3H	4H	JS	QS	KS	
	3H	4H	QS	KS	AS	
	3H	5H	6H	7H	8H	number skipped over at position P=1
	3H	5H	6H	7H	9H	
	3H	QH	JS	QS	KS	
	3H	QH	QS	KS	AS	
	3H	KH	AH	2D	3D	
	3H	KH	AH	2D	4D	
			•			
			•			
			•			
	10S	JS	QS	KS	AS	

Figure 5

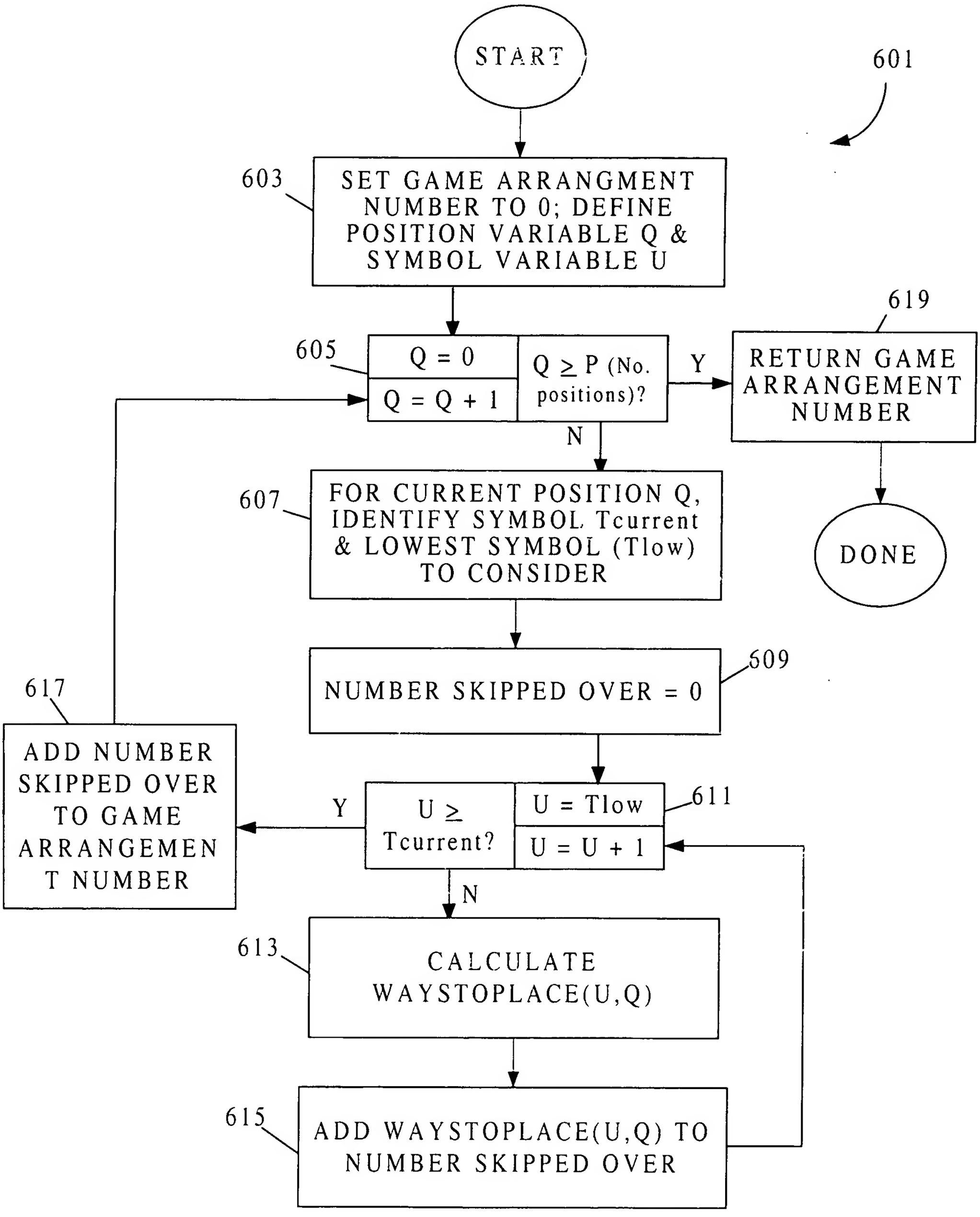
START
601
603
SET GAME ARRANGMENT NUMBER TO 0; DEFINE POSITION VARIABLE Q & SYMBOL VARIABLE U
605
Q = 0
Q = Q + 1
Q ≥ P (No. positions)?
Y
N
619
RETURN GAME ARRANGEMENT NUMBER
DONE
607
FOR CURRENT POSITION Q, IDENTIFY SYMBOL Tcurrent & LOWEST SYMBOL (Tlow) TO CONSIDER
609
NUMBER SKIPPED OVER = 0
611
U = Tlow
U = U + 1
U ≥ Tcurrent?
Y
N
617
ADD NUMBER SKIPPED OVER TO GAME ARRANGEMEN T NUMBER
613
CALCULATE WAYSTOPLACE(U,Q)
615
ADD WAYSTOPLACE(U,Q) TO NUMBER SKIPPED OVER

Figure 6

Convert KH, 7C, 4S, 8D, 3H to a number

Order the Cards! ⟶ 3H, KH, 8D, 7C, 4S

Start with # = 0
Position Q = 0
Symbol T= 1 (3H) 3H - - -
U = 0 (2H)
Compute # of ways to place 2H - - - - (choose (52-0-1, 5-0-2))
= 249,900
= 0 + 249,900 = 249,900

Position Q = 1, $T_{current}$ = KH, T_{Low} = 4H; 3H KH - - -

U = 2 (4H)
Compute # of ways to place 3H 4H - - -
= 18,424
# = 249,900 + 18,424 = 268,324
U = 3 (5H)
Compute # of ways to place (3H 5H - - -) = 17,296
# = 268,324 + 17,296 = 289,620
U = 4 (6H)
Compute # of ways to place (3H 6H - - -) = 16,215
# = # + 16,215 = 301,835
U = 5 (7H)
Compute # of ways to place (3H 7H - - -) = 15,180
# = # + 15,180 = 317,015
U = 6 (8H)
Compute # of ways to place (3H 8H - - -) = 14,190
# = # + 14,190 = 331,205
U = 7 (9H)
Compute # of ways to place (3H 9H - - -) = 13,244
# = # + 13,244 =344,449
U = 8 (10H)
Compute # of ways to place (3H 10H - - -) = 12,341
= # + 12,341 = 356,796

Figure 7A

U = 9 (JH)

Compute # of ways to place (3H JH - - -) = 11,480

= # +11,480 = 368,270

U = 10 (QH)

Compute # of ways to place (3H QH - - -) = 10,660

= # + 10,660 = 378,930

U = 11 (KH) This our symbol T. Stop and go to the next position.

Position Q = 2, Symbol T = 19 (8D)

---

by placing this card

#s skipped over by (3H - - - -)

= ways to place (2H - - - -)

by placing this card

skipped over by (3H KH - - -)

= ways to place (3H 4H - - -)

+ ways to place (3H 5H - - -)

+ ways to place (3H 6H - - -)

+ ways to place (3H 7H - - -)

+ ways to place (3H 8H - - -)

+ ways to place (3H 9H - - -)

+ ways to place (3H 10H - - -)

+ ways to place (3H QH - - -)

skipped over by (3H KH 8D - -)

= ways to place (3H KH 8D - -)

+ ways to place (3H KH AH - -)

+ ways to place (3H KH 2D- -)

+ ways to place (3H KH 3D - -)

+ ways to place (3H KH 4D - -)

Figure 7B

	Position Dependent	Position Independent
With Replacement	exp (x, y) $0 \leq U \leq T_{curr}$ $T_{low} = 0$	C (x, y) $T_{prev} \leq U \leq T_{curr}$ $T_{low} = T_{prev}$
Without Replacement	P (x, y) $0 \leq U \leq T_{curr}$ (excluding previously used values) $T_{low} = 0$	C (x, y) $T_{prev} < U < T_{curr}$ $T_{low} = T_{prev} + 1$

Figure 8

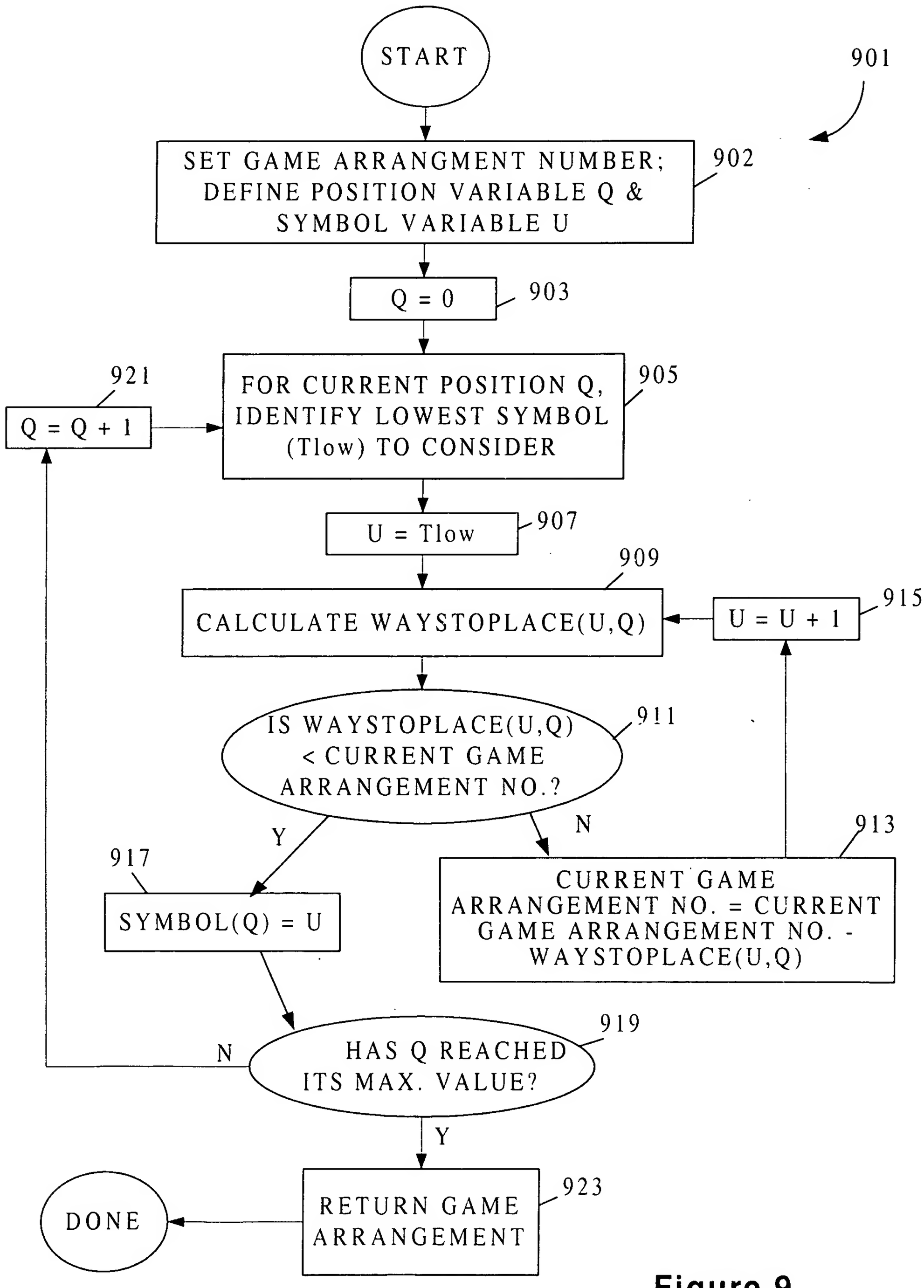
START
901
SET GAME ARRANGMENT NUMBER; DEFINE POSITION VARIABLE Q & SYMBOL VARIABLE U
902
Q = 0
903
FOR CURRENT POSITION Q, IDENTIFY LOWEST SYMBOL (Tlow) TO CONSIDER
905
U = Tlow
907
CALCULATE WAYSTOPLACE(U,Q)
909
U = U + 1
915
IS WAYSTOPLACE(U,Q) < CURRENT GAME ARRANGEMENT NO.?
911
Y
N
CURRENT GAME ARRANGEMENT NO. = CURRENT GAME ARRANGEMENT NO. - WAYSTOPLACE(U,Q)
913
SYMBOL(Q) = U
917
Q = Q + 1
921
HAS Q REACHED ITS MAX. VALUE?
919
N
Y
RETURN GAME ARRANGEMENT
923
DONE

Figure 9

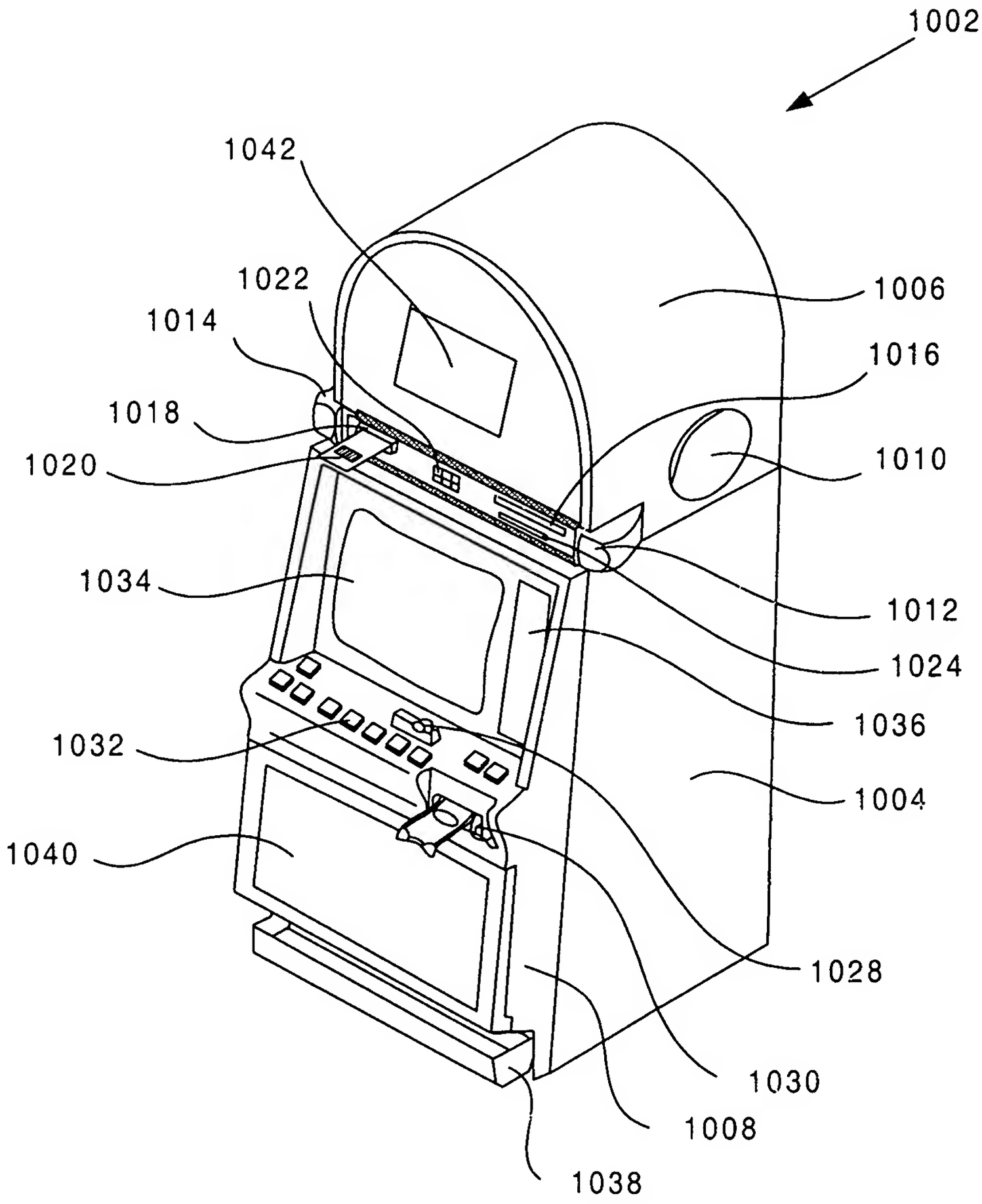
1002
1042
1022
1014
1018
1020
1034
1032
1040
1006
1016
1010
1012
1024
1036
1004
1028
1030
1008
1038

Figure 10

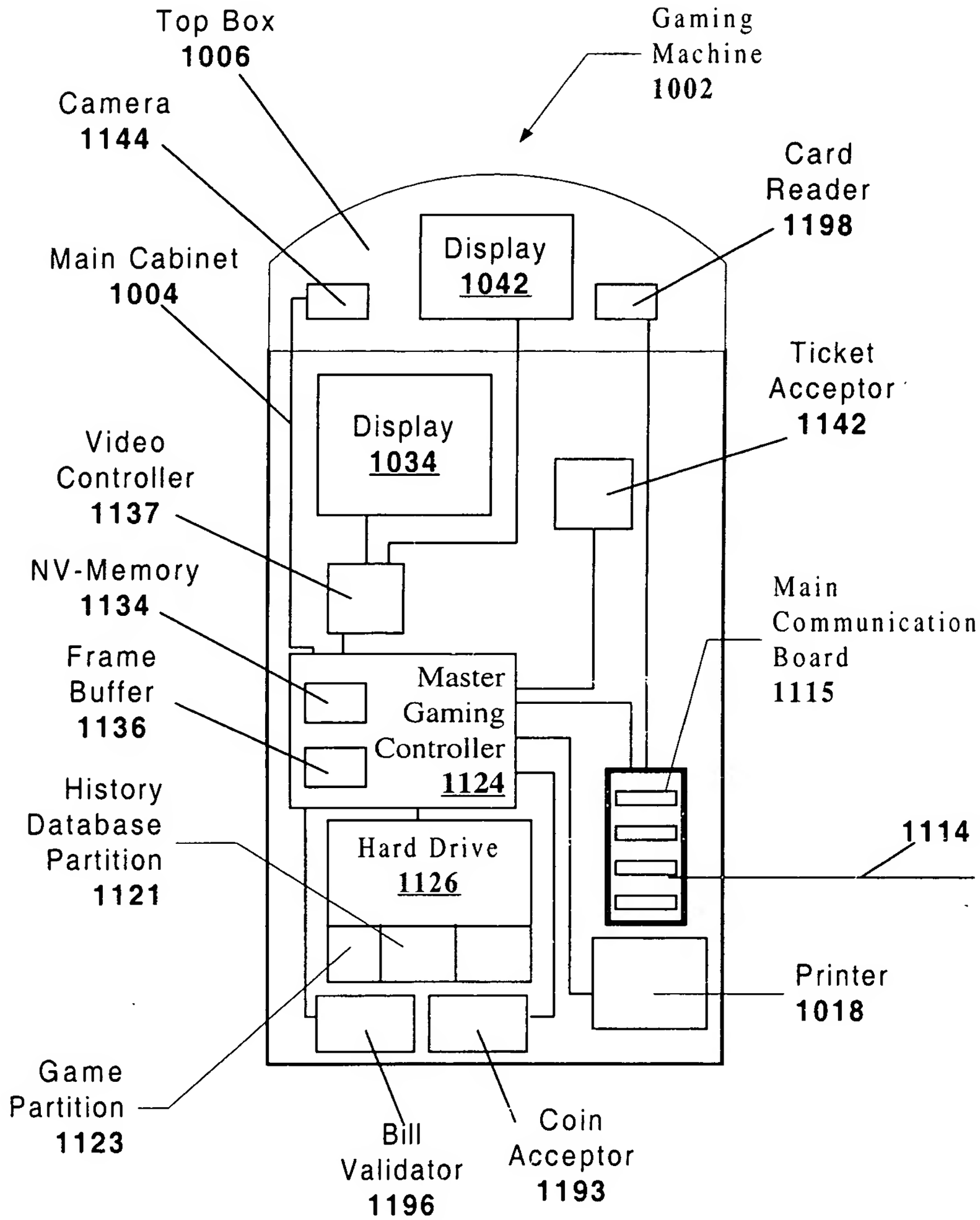

Figure 11